

Draft Five Year Schedule of Prioritized NCSP Experiments

DOE WORKSHOP: "NCSP Accomplishments"
ANS Annual Meeting
July 1, 2011



Integral Measurement Capabilities

- Critical Experiment Facility (CEF) Staff continued making limited subcritical and fundamental physics measurements during CEF construction
- CEF performed its first Critical Experiment for Start-up in June 2011
- CEF will start hands-on training in August 2011
- Sandia National Laboratory will continue to perform water moderated criticality experiments and training
- The US DOE continues collaborations with the French government for joint measurements/data acquisition
- VNIITF, Russia continues to perform experiments for US requested data needs



Current Status of Proposed Experiments

- To Date: Submitted at: <http://ncsc.llnl.gov/>
- 8 Subcritical CEF experiments requests approved/5 awaiting approval
- 1 VNIITF critical experiment in progress/1 awaiting approval
- 1 SILENE critical experiment in progress
- 2 VALDUC critical experiments awaiting approval
- 2 Sandia critical experiment in progress/2 approved/1 awaiting more data
- 5 stockpile science experiment requests approved/3 awaiting approval
- 6 NCT experiment requests approved/2 awaiting approval
- 4 NA-30 experiment requests approved
- 6 additional CEF critical experiment requests approved



Critical/Subcritical Experiment Priorities

- Immediate Criticality Safety Needs
- NA-11/NA-12 – Defense/Nuclear Weapons
- NA-40 – Emergency Ops
- NA-30 – Naval Reactors
- NA-20 – Nuclear Non-proliferations
- Programmatic Criticality Safety Needs
- EM
- NE
- Long Standing Criticality Physics Discrepancies



Critical Experiment Requests - Current

| Priority | Comments | Record No. | Request Date | Requester Name | Experimental Request Title | Status |
|-----------|---|------------|--------------|-------------------|---|------------------|
| 2010-1snl | In progress at SNL | 135 | 9/7/10 | Harms, Gary Alan | Reactor Physics and Criticality Benchmark Experiments for Advanced Nuclear Fuel | CED-3b initiated |
| 2011-1sub | Priority #1 for NNSA | 128 | 1/14/10 | Reynolds, Kevin H | Juliett | CED-1 approved |
| 2011-1 | First experiment to be performed to garner new data for NCSP, will be done as part of start-up plan | 163 | 4/22/11 | Bredeweg, Todd | Reaction rate and fission-product yield measurements with the COMET assembly | CED-1 pending |
| 2011-1v | In progress at VNIITF, will take two years | 129 | 5/20/10 | Briggs, J. Blair | Integral Tests of Molybdenum at VNIITF | CED-3b initiated |



Critical Experiment Requests - Current (cont'd)

| Priority | Comments | Record No. | Request Date | Requestor Name | Experimental Request Title | Status |
|-----------|--|------------|--------------|-----------------------|--|------------------|
| 2011-1snl | In progress at SNL | 159 | 3/2/11 | Harms, Gary Alan | 7uPCX 0.855 cm Pitch, Pure Water Moderator | CED-3b initiated |
| 2011-2snl | In progress at SNL, being used as part of Pilot Training Course | 158 | 2/21/11 | Harms, Gary Alan | Re-establish the Burnup Credit Critical Experiment | CED-3b initiated |
| 2011-1f | Already performed in France but still evaluating data results, then will write it up for ICSBEP | 126 | 11/18/09 | Miller, Thomas Martin | SILENE Benchmark Measurements for Criticality Accident Alarm System Analyses | CED-3b initiated |
| 2011-2f | To be performed in France and data not to be released until 2017 unless release signed and part of DOE | 170 | 6/1/11 | Briggs, J. Blair | MIRTE-2: Reactivity Characteristics of Cr, Mn, Mo, & Cl, at Thermal Energies | CED-0 pending |



What's Next?

- McKamy to approve FY2012 IERs
- Assign Level 2 Milestones to EACH C_E dT step of the process
- Document in the FY2012-2016 5-Year Plan in Appendix D Gant Charts
- Start performing Critical Experiments at CEF gathering new data for NCSP



Critical Experiment Requests - 2012

| Priority | Comments | Record No. | Request Date | Requestor Name | Experimental Request Title | Status |
|----------|---|------------|--------------|---------------------|---|----------------|
| 2012-1 | First PLANET run in its new environment, essential to determine operability & characteristics of the new environment. | 137 | 10/11/10 | White, Morgan C | High Precision HEU Critical Assembly Measurements To Understand Reproducibility | CED-1 approved |
| 2012-2a | Priority to understand facility counting and chemistry as well as new environment for FLATTOP. | 136 | 9/30/10 | Bredeweg, Todd | Reaction rate and fission-product yield measurements in Pu-239 and U-238,235 | CED-1 pending |
| 2012-2b | Performed concurrent w/ 136 outside of FLATTOP. | 144 | 11/5/10 | Church, Jennifer A. | Time Dependent Assay of Activation Foils (OUO) | CED-0 pending |



Critical Experiment Requests - 2012 (cont'd)

| Priority | Comments | Record No. | Request Date | Requestor Name | Experimental Request Title | Status |
|-----------|---|------------|--------------|-----------------------|---|---------------|
| 2012-2 | 1st GODIVA run in new environment. Priority dosimetry exercise with French. | 147 | 1/17/11 | Heinrichs, David Paul | Reference values of the Godiva radiation field in DAF | CED-1 pending |
| 2012-3 | Physics longstanding issue, NA-10 priority | 153 | 1/25/11 | White, Morgan C | Measure The Fission Neutron Spectrum Shape Using Threshold Activation Detectors | CED-1 pending |
| 2012-4 | No issues, Follows 136, on FLATTOP | 149 | 1/20/11 | Kenneally, Jacqueline | Fission product studies | CED-1 pending |
| 2012-1sub | This will be redone in 2012. The Benchmark will be revised accordingly. | 160 | 6/30/08 | Hutchinson, Jesson | Plutonium Sphere Reflected with Tungsten | CED-1 pending |



Critical Experiment Requests - 2012 (cont'd)

| Priority | Comments | Record No. | Request Date | Requestor Name | Experimental Request Title | Status |
|-----------|--|------------|--------------|-----------------------|---|------------------|
| 2012-2sub | After successful completion of 160, the Benchmarks will be revised accordingly. | 106 | 12/19/07 | Mattingly, John Kelly | Polyethylene-Reflected Plutonium Neutron Multiplicity and Gamma Spectral Data | CED-4a Initiated |
| 2012-1snl | Possible first TEX experiment. International CEdT possible based on TEX kick-off meeting in July | 117 | 9/23/08 | Kerr, Brad R | Thermal neutron absorption cross-section data for Titanium | CED-0 pending |
| 2012-1f | Part of CAAS series of exercises for SILENE, CEF, and CALIBAN, will start design this year | 174 | 6/15/11 | Miller, Thomas Martin | CALIBAN Benchmark Measurements for Criticality Accident Alarm System Analyses | CED-0 pending |



Questions?

